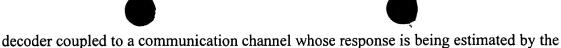I claim:

1   1. A channel estimator having an input and an output, the channel estimator comprising:

2   a plurality of distinct filters selectably coupled to the input and the output

3   wherein each one of the plurality of filters has a different set of pre-calculated filter

4   coefficients; and

5   a switching circuit that selects one of the plurality of distinct filters based

6   on an error signal.

1   2. The channel estimator of claim 1 wherein the plurality of filters comprises N filters

2   where N is an integer equal to 2 or greater and each one of the N filters has a different

3   order.

1   3. The channel estimator of claim 1 wherein the plurality of filters comprises N filters

2   where N is an integer equal to 2 or greater and each one of the N filters is a non-recursive

3   filter.

1   4. The channel estimator of claim 1 where the pre-calculated filter coefficients are

2   calculated using Lagrangian interpolation.

1   5. The channel estimator of claim 1 where the pre-calculated filter coefficients are

2   calculated using interpolation other than Lagrangian.

1   6. The channel estimator of claim 1 wherein each one of the plurality of filters has an

2   input path and an output path whereby the input path of a selected filter is coupled to the

3   input and the output path of the selected filter is coupled to the output.

1   7. The channel estimator of claim 1 wherein the error signal is received from a

2   decoder coupled to a communication channel whose response is being estimated by the

3   channel estimator.

1   8.   A method for estimating a response of a communication channel, the method

2   comprises the steps of:

3   providing a plurality of distinct selectable filters each of which has an order and a

4   different set of pre-calculated coefficients; and

5   selecting one of the plurality of distinct filters based on an error signal

6   resulting from a decoding operation on a signal from the communication channel.

1   9. The method of claim 8 further comprising the steps of:

2   receiving reference signals which have propagated through the communication

3   channel; and

4   applying the received reference signals to the selected filter.

1   10. The method of claim 9 wherein the step of applying the received reference signal to

2   the selected filter comprises determining a quantity of received reference signals to be

3   applied thus determining the order of the selected filter.

1   11. The method of claim 8 where the step of selecting one of the plurality of distinct

2   filters comprises the steps of :

3   establishing a value for the received error signal;

4   establishing a threshold value that is a function of the error signal; and

5   selecting the one filter based on the value of the received error signal relative to the value

6   of the established threshold.